THE KINGSBURY CENTER, INC.

Traffic Impact Analysis

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OFFICE OF ZONING
DISTRICT OF COLUMBIA

Prepared For

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Washington, DC

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#23

Board of Zoning Adjustment
District of Columbia
CASE NO.16569
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INTRODUCTION

The purpose of this report is to present the findings of a Traffic Impact Analysis (TIA) for the proposed relocation of The Kingsbury Center, Inc. in Washington, DC. The Kingsbury Center is proposing to relocate within northwest Washington D.C. in order to serve the existing student population better, and to accommodate a planned future increase in students.

The Kingsbury Center is proposed to be developed at the current Dickson Mansion, on property bounded by Gallatin Street to the north, 14th Street to the east, and Piney Branch Road to the west. The regional site location is illustrated in Figure 1.

The objectives of this study have been to:

- Determine existing traffic conditions within the proposed study area
- Determine the trip generation associated with the existing school
- Project future traffic conditions at the proposed site with the development of The Kingsbury Center
- Assess existing and future conditions to determine roadway levels of service
- Develop a circulation plan to accommodate The Kingsbury Center-related motorists on-site to minimize interference with the normal flow of traffic on adjacent roadways.

The following tasks were undertaken as part of this study:

- Existing traffic counts and field observations were made at the proposed site location on Monday September 13, 1999.
- Existing traffic counts and field observations were made at the existing school on Tuesday, February 29, 2000.
- Intersection capacity analyses were performed for Existing and Future Conditions.

Sources of data for this study include The Kingsbury Center, Inc. ; Bowie-Gridley Architects; and the files and library of Gorove-Slade Associates, Inc.

Scope of Study

A standard traffic impact analysis was undertaken to determine the existing conditions of the roadway network adjacent to the proposed Dickson Mansion site and the impacts of the proposed development. The impacts of the development traffic were assessed under future conditions.



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Figure 1
Regional Site Location Map

The following intersections were included in this study:

- 14th Street/Gallatin Street
- 14th Street/Iowa Avenue/Emerson Street
- Piney Branch Road/Emerson Street
- Piney Branch Road/Farragut Street
- Piney Branch Road/Gallatin Street

In addition, the four site driveways located on 14th Street and Piney Branch Road were assessed under future conditions.

This report presents the findings of analyses performed for the following conditions:

Existing Conditions
Considers existing traffic flow and the existing roadway configurations at the proposed site location

Future Conditions
Considers future traffic flow and the proposed site access and circulation system. This scenario accounts for traffic volumes associated with the total enrollment planned for the ultimate buildout of The Kingsbury Center.

Background Information

The existing Kingsbury Center is located west of Connecticut Avenue in the Kalorama section of Washington, D.C. on Bancroft Place and on Phelps Place. The school currently consists of 100 students. School is in session from 8:30 AM to 3:15 PM for all students. Approximately ten students participate in an after-school program until 6:00 PM.

When The Kingsbury Center relocates to the Dickson Mansion in the fall of 2001, the school anticipates that its enrollment will have reached 146 students. The Kingsbury Center is seeking a cap of 300 students. Therefore, the future analysis presented in this report reflects the ultimate cap of 300 students. In order to accommodate this increase, The Kingsbury Center is proposing to renovate the interior of the existing Dickson Mansion. The Dickson Mansion is currently vacant and there is no resulting traffic associated with its current use.

Currently, faculty and staff at The Kingsbury Center arrive before the influx of students during the morning peak hour and leave after the afternoon school peak hour. The Center currently has 64 full-time equivalents (FTEs) on its staff. The Kingsbury Center's faculty/staff will consist of 91 FTEs when the school relocates to the Dickson Mansion Site. The Kingsbury Center is seeking a cap of 138 FTEs for the full enrollment of 300 students. Therefore, the analysis in this report reflects the ultimate cap of 138 FTEs.

EXISTING CONDITIONS

Existing Roadway Network

The proposed Kingsbury Center site is bounded by Gallatin Street to the north, 14th Street to the east, and Piney Branch Road to the west. The roadways within the study area are described below and are illustrated in Figure 2.

- 14th Street is a north-south arterial roadway in the vicinity of the site with parking permitted on both sides of the street during non-rush hour periods. 14th Street is signalized at Gallatin Street in the vicinity of the site.

- Piney Branch Road is a north-south local roadway that extends from Buchanan Street to Colorado Avenue. Piney Branch Road is stop-controlled at Gallatin Street and at Emerson Street.

- Gallatin Street is a two-lane east-west local roadway that extends from 16th Street from the west to Fort Totten Road to the east. Gallatin Street is signalized at 14th Street and stop-controlled at Piney Branch Road, in the vicinity of the site.

- Farragut Street is a local east-west roadway that extends from 16th Street from the west to Piney Branch Road to the east. This roadway also extends from 14th Street from the west to New Hampshire Avenue to the east. Farragut Street is stop controlled at its eastbound approach to Piney Branch Road.

- Emerson Street is a two-lane east-west roadway that extends from 16th Street to the west to New Hampshire Avenue to the east. Emerson Street is stop-controlled at 14th Street in the vicinity of the site.

Existing Traffic Volumes

Existing traffic volumes at the Dickson Mansion site were collected from Monday, September 13, 1999 to Wednesday September 15, 1999 from 7:30 AM - 9:30 AM, and 3:00 PM - 4:30 PM. Traffic counts were conducted during the time periods that coincided with the start and dismissal times of the existing school. Traffic counts that were conducted at the existing school on Tuesday, February 29, 2000, were used to determine existing trip generation and the peak study time periods. Based on these counts the hour of highest activity at the existing school were determined to be 7:45 AM - 8:45 AM and 2:45 PM - 3:45 PM. The existing peak hour traffic volumes are shown in Figure 3. Count summary sheets are included in the Technical Appendix to this report.

Field observations were made at the existing school site during the time when traffic counts were conducted. The following existing observations were made:

- The maximum queue of vehicles due to student drop-off in the morning was two vehicles and nine mini-buses. The peak queue of passenger vehicles lasted less than approximately two minutes. However, the peak queue of mini-buses lasted approximately fifteen minutes.

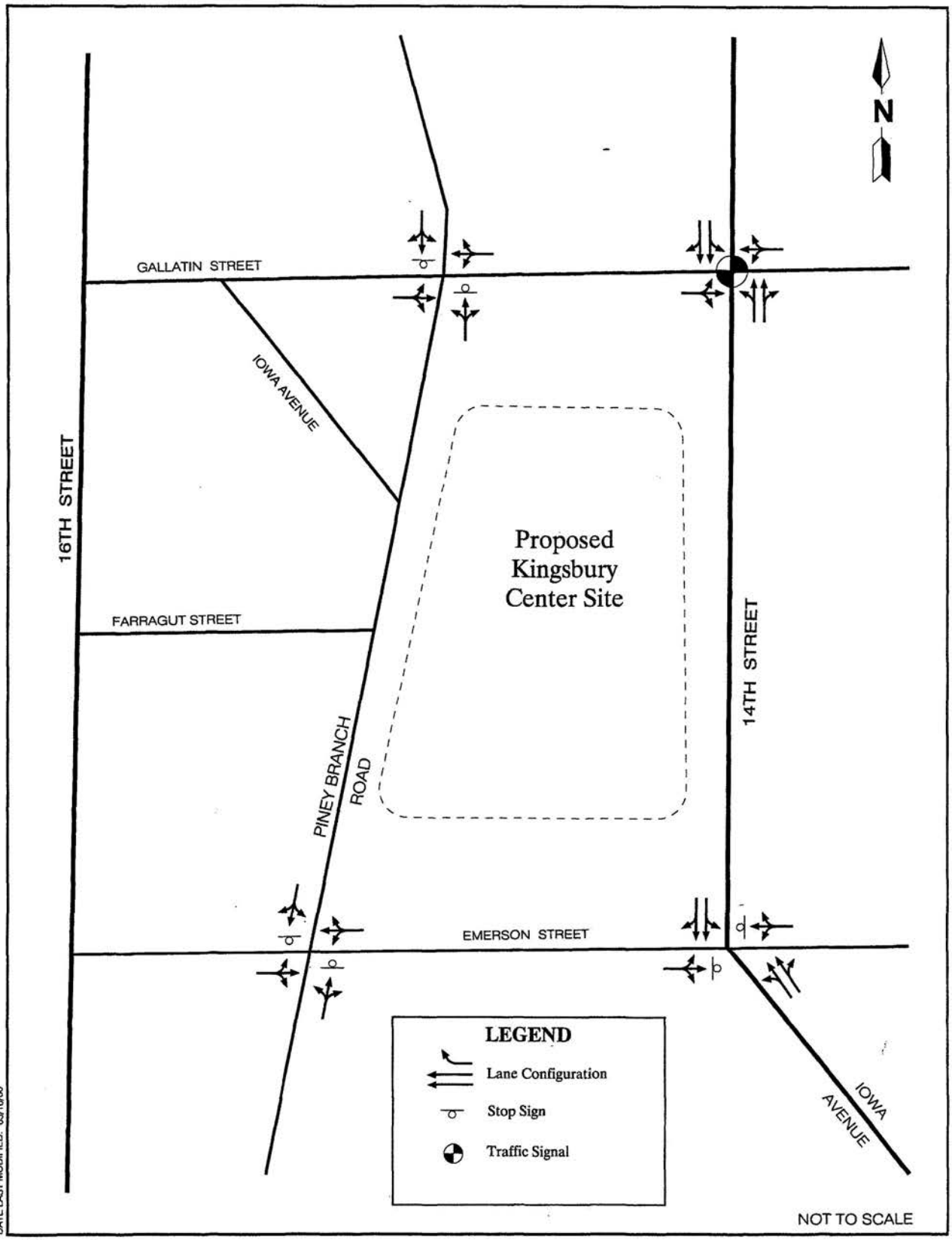


Figure 2
Exsiting Site Location and Lane Configurations

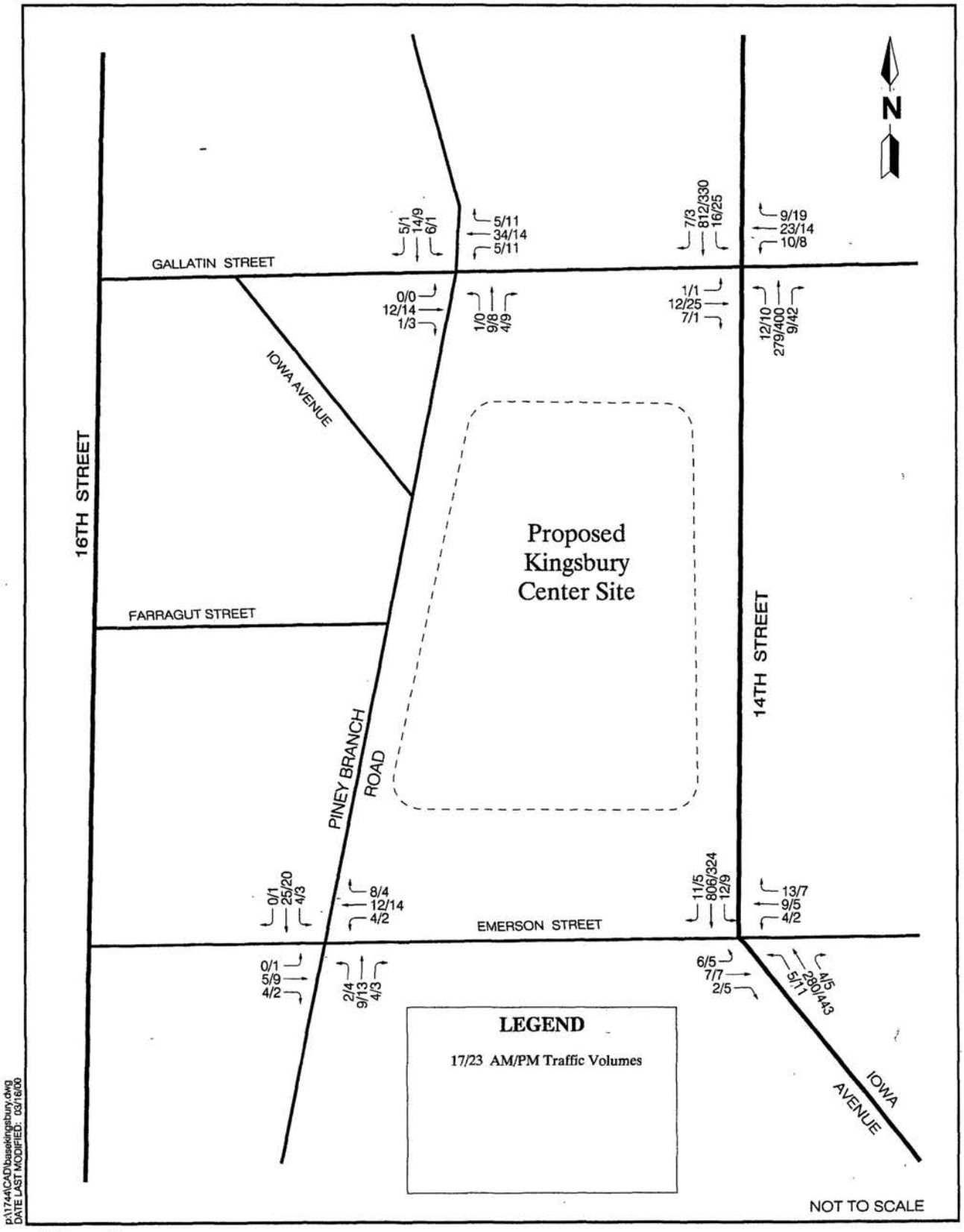


Figure 3
Exsiting Traffic Volumes

- The maximum queue of vehicles due to student pick-up in the afternoon consisted of eleven mini-buses and 8 vehicles stacked and occurred at 2:45 PM. The afternoon queue of passenger vehicles lasted less than 5 minutes. The afternoon queue of mini-buses lasted approximately 15 minutes.

Existing Capacity Analysis

A capacity analysis was performed to determine the existing Level of Service (LOS) for the AM and PM peak hours for intersections within the study area. The capacity analyses are based on methods outlined by the Transportation Research Board's Special Report 209: Highway Capacity Manual (HCM), 1997. Levels of service range from "A" (best) to "F" (worst). A detailed description of each level of service is included in the Technical Appendix to this report. The results of the LOS capacity analysis are summarized in Table 1.

Table 1
Existing Capacity Analysis

Intersection		Level of Service	
		AM Peak Hour	PM Peak Hour
14th Street/Gallatin Street	Intersection	B	B
14th Street/Emerson Street	Eastbound Approach	C	B
	Westbound Approach	C	B
Piney Branch Road/Gallatin Street	Intersection	A	A
Piney Branch Road/Farragut Street	Eastbound Approach	A	A
Piney Branch Road/Emerson Street	Northbound Approach	A	A
	Southbound Approach	A	A

The results of the existing capacity analysis indicate that all intersections within the study area currently operate at an acceptable LOS of C or better.

FUTURE CONDITIONS

Site Access and Circulation

A site access and circulation system was developed to accommodate Kingsbury Center-related vehicles on-site to minimize their interference with the normal flow of traffic on the adjacent roadways. Existing curb cuts at the Dickson Mansion will be maintained and utilized for The Kingsbury Center in the future. The Kingsbury Center has established a two-way system to access the parking located on the west side of the campus. For pick-up and drop off operations at the front door of the Kingsbury Day School within The Kingsbury Center, parents will be able to drive in a clockwise direction towards the front of the Kingsbury Day School to drop-off and pick-up students on the passenger (right) side of the vehicle. The Kingsbury Center circulation system will allow access into the northern most driveway on 14th Street as an entrance and the southern most driveway on 14th Street as a right-turn only exit. The driveway on Piney Branch Road aligning with Farragut Street will be used as an entrance, and the northern most driveway will be used for egress. The existing alley adjacent to the south side of the site exists as a buffer and will not be used to access any driveway of the Dickson Mansion site. The Kingsbury Center site access and circulation system is presented in Figure 4.

Based on preliminary conversations with community members, the southernmost driveway on 14th Street was identified as a driveway that has access issues due to its proximity to the curving alignment along 14th Street and also to its proximity to the intersection of 14th Street and Emerson Street. The extent of the majority of the impact generated by The Kingsbury Center is concentrated primarily within the 20 minutes before school starts and the 15 minutes before school ends. Therefore, the impact of The Kingsbury Center is concentrated in two short periods of time during a normal day. To address the concerns of the community members, the southernmost 14th Street driveway is limited to right-turn out only to allow for sufficient sight distance for vehicles turning right onto 14th Street. It is recommended that this driveway be utilized to disperse outbound traffic exiting The Kingsbury Center and to provide direct and convenient access for parents headed downtown. The analysis presented in this document reflects the utilization of the southernmost driveway on 14th Street.

Trip Generation

The existing traffic generation associated with the current school driveway accounts for the traffic generated by the existing school. In the future, the existing student population is projected to increase from 100 students to a limit of 300 students. Traffic generation has been projected to increase by a similar rate accounting for the existing auto occupancy rate that currently occurs at the existing site. A majority of the school's students are currently transported to and from the school by mini-buses, which are half the size of full-size buses and currently arrive at The Kingsbury Center not fully occupied. It was estimated that 3 additional mini-buses would be needed to accommodate the increase in student population with the notion that the capacity of the existing mini-buses arriving at the site were better maximized. Based on existing school transportation records, 66% of the school population is bused to The Kingsbury Center on 11 mini-buses from Maryland, Virginia, and the District of Columbia. The trip generation projections reflect the after-school program for approximately 30 students. In addition, the trips arriving at The Kingsbury Center in the morning will not coincide with the activity at the West Elementary School which starts at 9:00 AM, a half-hour later than The Kingsbury Center. Table 2 summarizes the existing and projected trip generation for the AM and PM peak hours.

Table 2
Trip Generation

	AM Peak Hour			PM Peak Hour		
	Enter	**Exit**	**Total**	**Enter**	**Exit**	**Total**
Existing Trip Generation (100 Students)	45[A]	45[A]	90	33[C]	33[C]	66
Projected Trip Generation (limit of 300 Students)	116[B]	116[B]	232	80[D]	80[D]	160

Note: A - represents 34 passenger cars and 11 mini-buses
B - represents 102 passenger cars and 14 mini-buses
C - represents 22 passenger cars and 11 mini-buses
D - represents 66 passenger cars and 14 mini-buses

Trip Distribution

The directional distribution of motorists approaching the proposed The Kingsbury Center site was determined using the zip codes of students who currently attend the school. The majority of motorists are expected to arrive via 14th Street, Gallatin Street, and Farragut Street. The directional distribution of motorists leaving the proposed site was modified to incorporate the number of parents who arrive from the north, drop their children off and then travel south towards the central business district. The directional distribution of the trips generated by the expansion is presented in Figure 5 for the AM carpool operations and Figure 6 for the PM carpool operations.

Future Traffic Volumes

The projected trips shown in Table 2 were assigned to the roadway network using the directional distribution shown in Figures 5 and 6. These site related traffic volumes were then added to existing traffic volumes (Figure 3) to produce future volumes. The future traffic volumes are presented in Figure 7.

The Kingsbury Center proposes to occasionally provide Saturday testing from 8:30 AM to 1:30 PM that will attract approximately 20 students to be tested over a 5-hour period. This program will be staffed by ten staff members. This program generates a minimal amount of traffic and can be accommodated by the significant supply of parking.

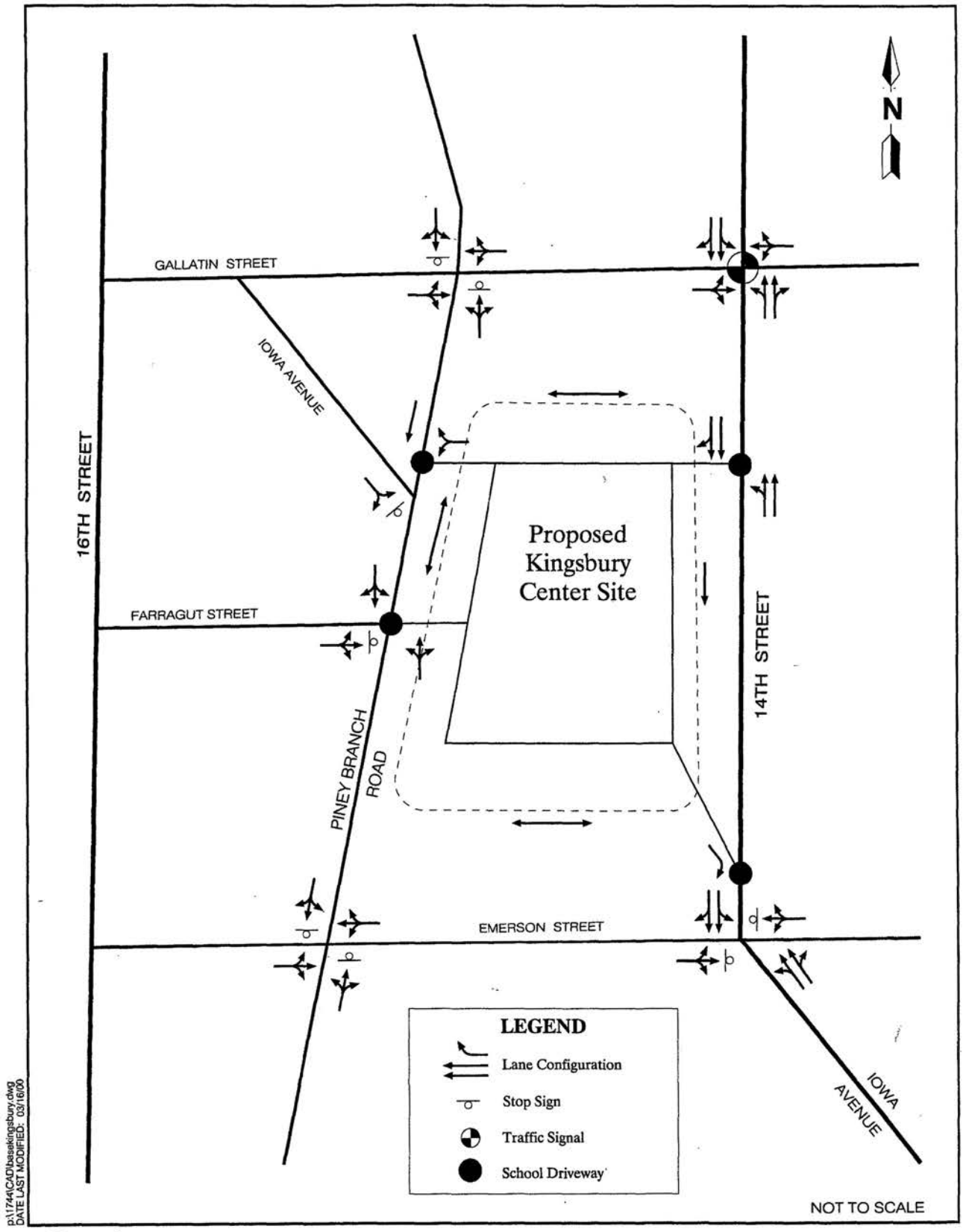


Figure 4
Future Site Access System

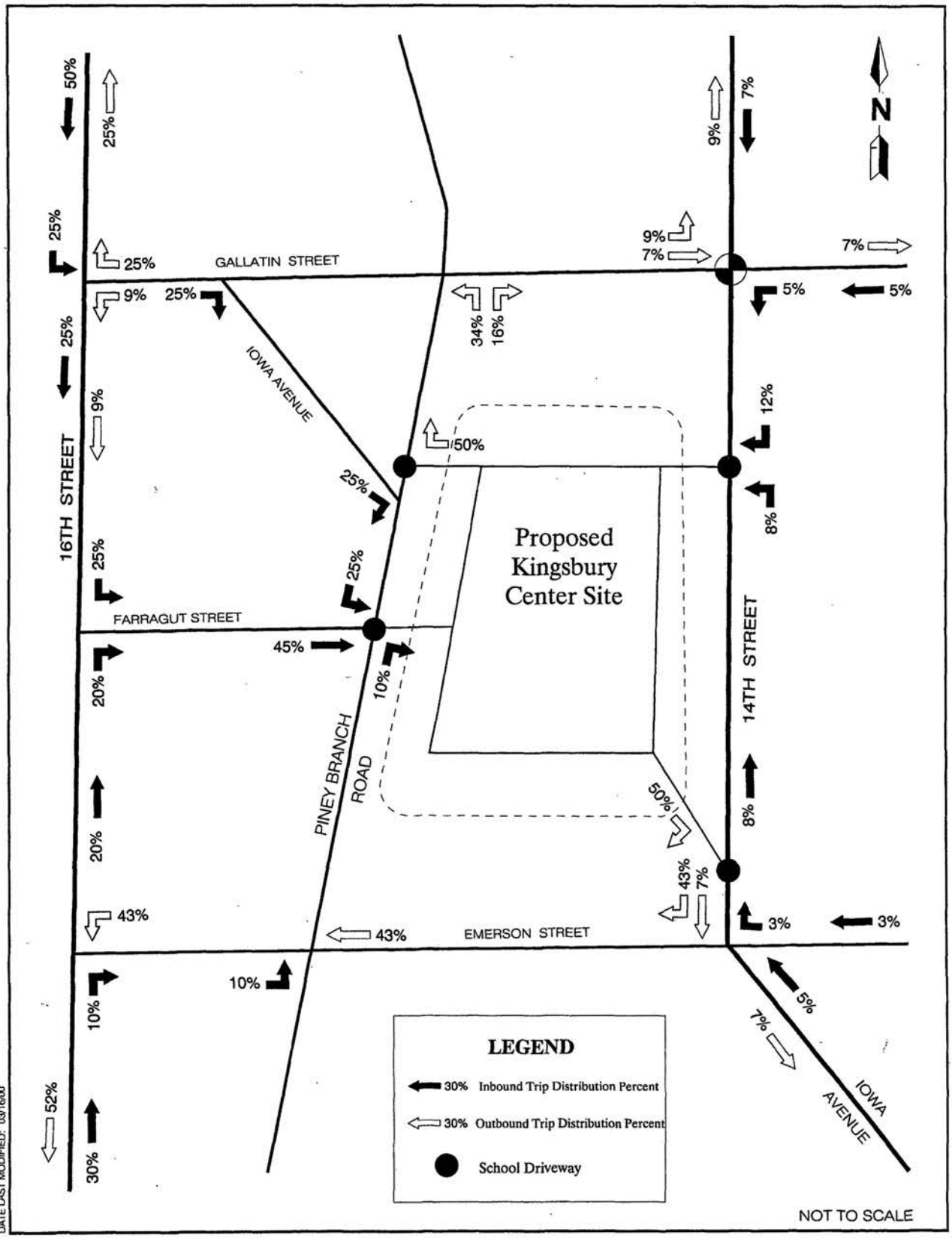


Figure 5
Directional Distribution - AM Peak Hour Site Trips
(based on student zip code information)

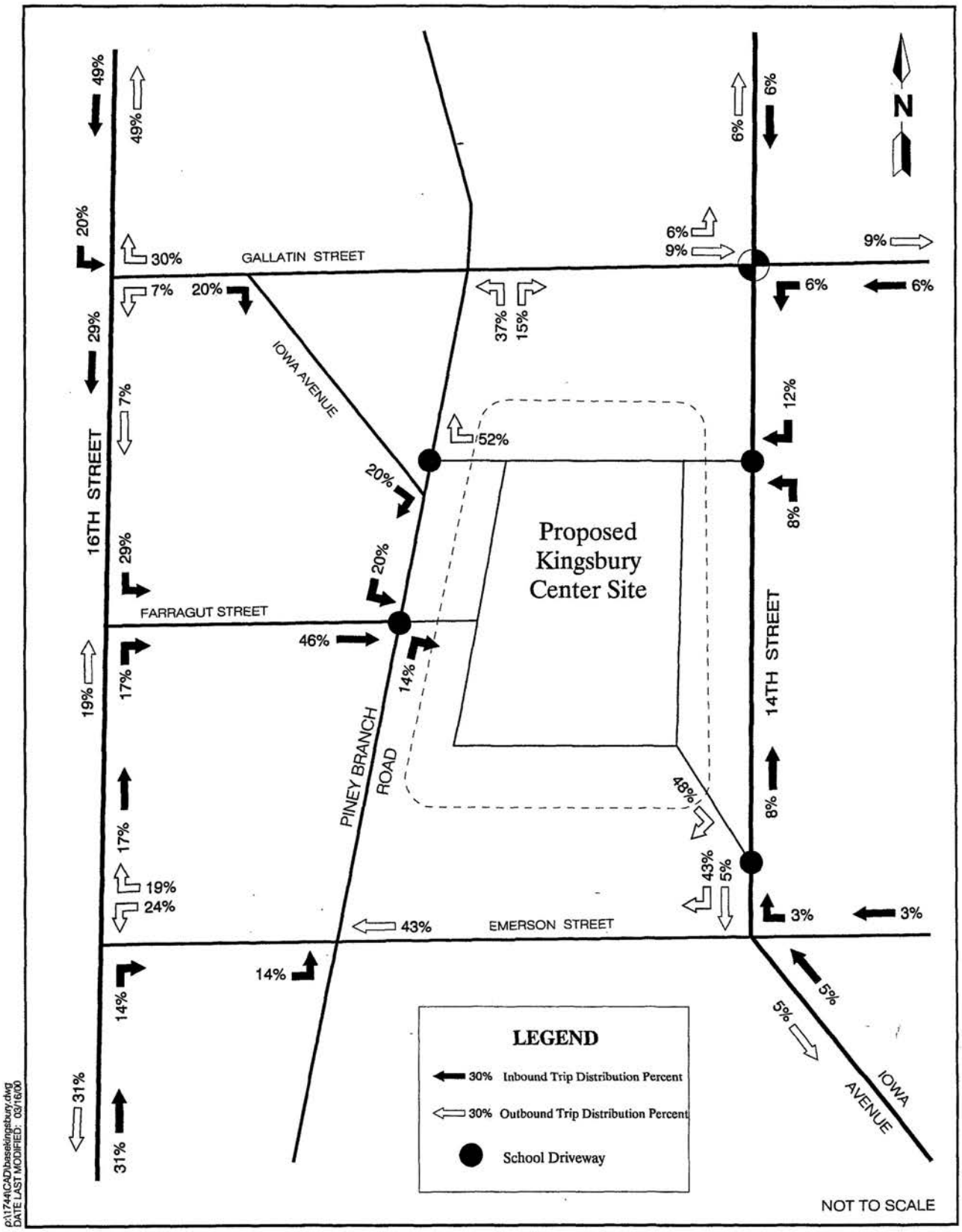


Figure 6
Directional Distribution - PM Peak Hour Site Trips
(based on student zip code information)

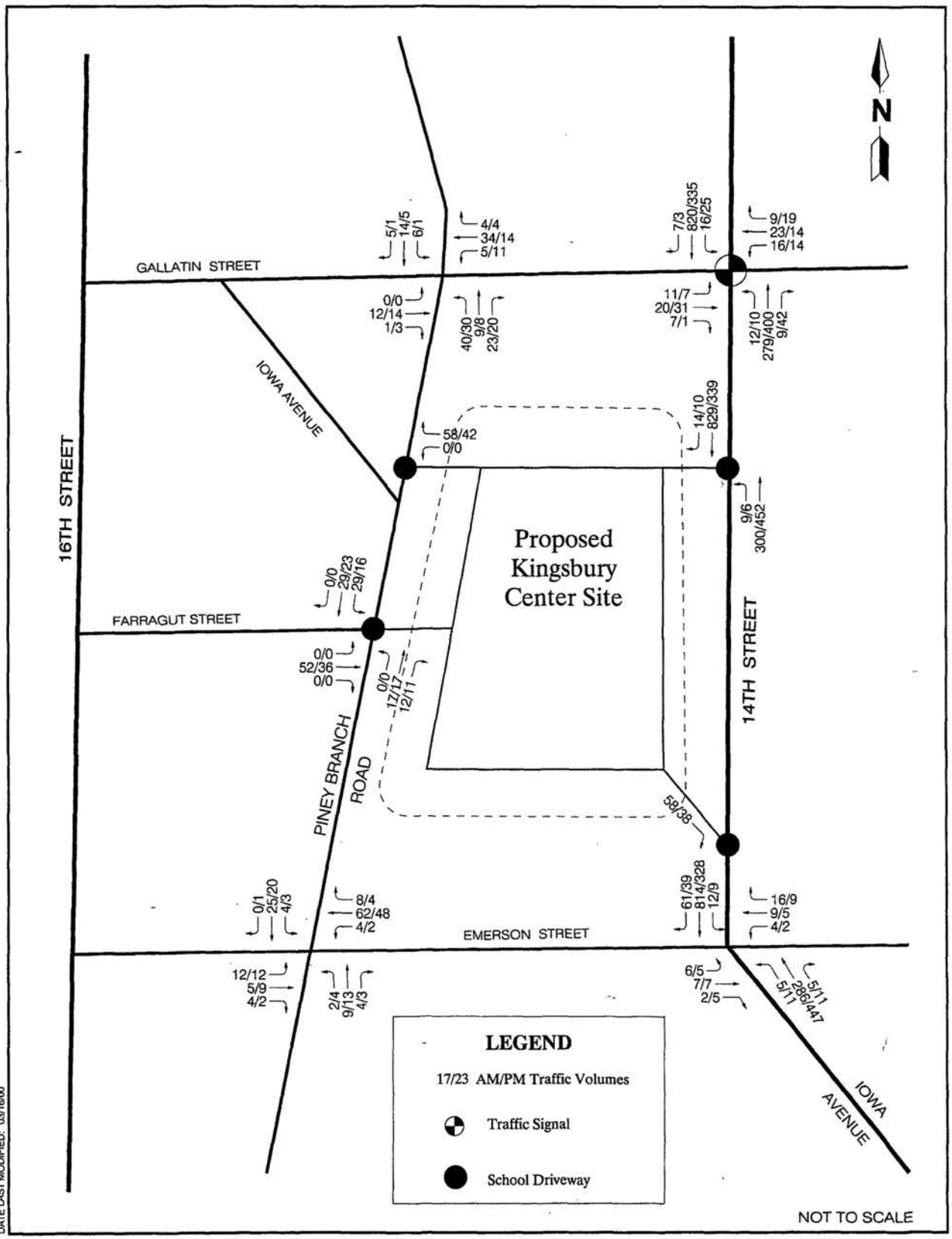


Figure 7
Future Traffic Volumes with The Kingsbury Center

Future Conditions Capacity Analysis

A future capacity analysis was performed to determine the level of service of intersections within the study area under projected conditions. The results of the future capacity analysis are summarized in Table 3. A level of service D (see appendix for levels of service descriptions) was used as the acceptable level of service standard for peak hour street traffic design.

Table 3
Future Conditions Capacity Analysis

Intersection		Level of Service	
		AM Peak Hour	PM Peak Hour
14th Street/Gallatin Street	Intersection	B	B
14th Street/Emerson Street	Eastbound Approach	D	C
	Westbound Approach	C	B
14th Street/Eastern Site Ingress	Intersection	A	A
14th Street/Eastern Site Egress	Intersection	B	A
Piney Branch Road/Gallatin Street	Intersection	A	A
Piney Branch Road/Farragut Street/Western Site Ingress	Intersection	A	A
Piney Branch Road/Emerson Street	Northbound Approach	A	A
	Southbound Approach	A	A
Piney Branch Road/Western Site Egress	Intersection	A	A

As Table 3 indicates, all of the intersections continue to operate at acceptable levels of service with the relocation of The Kingsbury Center. In addition, the four proposed site driveways are projected to operate at acceptable levels of service B or better.

Future Queuing Considerations

The access and circulation system for the proposed site consists of a morning and an afternoon circulation pattern that will be assisted by The Kingsbury Center staff. As stated earlier, the internal site circulation will consist of a one-way southbound right-side drop-off and pick-up area in front of the school and will consist of a two-way operation around the rest of the campus to access parking along the circulation road. These directional patterns will remain consistent for both the morning and afternoon carpool operations.

The morning carpool operations will allow ingress and egress from the west and east sides of the campus. This operation provides the opportunity to enter the campus from either the east side or west side of the school building. The maximum morning carpool queue currently occurring at the existing site consists of a maximum of two passenger vehicles and 9 mini-buses at any one time. It is projected that with the relocation and potential expansion of the school, the maximum morning queue is projected to be approximately 6 passenger cars and 11 mini-buses. This projected maximum queue can be accommodated on-site with the assumption that the current

schedule of arrivals at the school is carried over to the new site. The morning carpool operations are usually more efficient due to the nature of the activity associated with dropping a student off as compared to picking a student up.

The afternoon carpool operations will allow ingress and egress from both sides of the campus. The maximum afternoon carpool queue currently occurring at the existing site consists of a maximum of 8 passenger vehicles and 11 mini-buses at any one time. It is projected that with the relocation and potential expansion of the school, the maximum morning queue will be approximately 24 passenger vehicles and 14 mini-buses, assuming that all of the grades are dismissed at the same time as it currently occurs at the existing site.

Overall Safety Considerations

It is important to maintain a safe environment for the school to operate its access and circulation system. As part of the traffic plan, the internal roadways have been designed to accommodate two lanes of traffic throughout most of the site to enable safe passage of vehicles throughout the campus as motorists access parking on the periphery of the circulation road. In addition to this design feature, the passenger drop-off was located on the right side for The Kingsbury Day School to accommodate the safety needs of the younger children that will be attending the school.

In addition to the internal aspects of the site, it is recommended that school speed zone signs be installed on 14th Street to warn motorists in the area to slow down during the morning and afternoon school hours. This recommendation will be coordinated with the District of Columbia Department of Public Works to serve The Kingsbury Center, the West Elementary School, and the surrounding community, especially on 14th Street.

Parking Considerations

The proposed parking supply for The Kingsbury Center consists of 124 parking spaces. The proposed parking supply was developed to meet the parking requirements mandated by zoning regulations and also to meet the practical requirements of the Center.

The following calculations identify the zoning requirements for off-street parking:

Elementary and Junior High School :

2 spaces for every 3 faculty/staff members

High School

2 spaces for every 3 faculty/staff members + 1 for every 20 classroom seats **or** 1 for every 10 seats of the largest auditorium, gymnasium or public assembly space

- Fall 2001: No high school students, only 146 elementary and junior high students Total parking requirement = 2/3 of 91 faculty/staff = 60 parking spaces

- At capacity: 200 elementary and junior high students, 100 high school students, 138 faculty/staff

  Total parking requirement = 2/3 of 138 faculty/staff + (1/20 of 100 high school seats **or** 1/10 of 150-person multipurpose room)

  = 92 + (5 or 15)

  = 107 parking spaces

The off-street parking requirement at capacity based on zoning consists of 107 parking spaces, which can be served by the proposed parking supply of 124 parking spaces. Seventeen spaces of the proposed parking supply would be available for visitors and parents. Although sufficient parking is provided on site, unrestricted curbside parking on the west side of 14th Street directly in front of the subject property is available in the event that there is a need for overflow parking.

CONCLUSIONS

The objective of this study was to determine the traffic issues and identify recommendations for the proposed relocation of The Kingsbury Center. The major findings and conclusions reached through this study are as follows:

Existing Conditions

- All of the intersections studied for the proposed relocation site currently operate at acceptable levels of service during the AM and PM peak hours.
- The existing site currently starts at 8:30 AM and ends at 3:15 PM with an afterschool program that lasts until 6:00 PM.
- Sixty-six percent (66%) of the existing student population of 100 students currently use bus service from Maryland, Virginia, or the District of Columbia to arrive at and depart from the school.
- The existing maximum AM carpool queue consists of 2 passenger cars and 9 mini-buses. Similarly, in the afternoon, the maximum PM carpool queue consists of 8 passenger cars and 11 mini-buses.

Proposed Future Conditions

- With the proposed expansion, all of the studied intersections will continue to operate at acceptable levels of service during the AM and PM peak hours
- The proposed circulation and access system allows for one-way right-side student drop-off and pick-up in front of the school and two-way circulation around the rest of the campus.
- The morning and afternoon carpool operations will allow ingress and egress from the west and east sides of the campus.
- The maximum internal stacking space is adequate to accommodate 24 passenger cars and 14 mini-buses on-site.

Overall Safety Considerations

- Student drop-off and pick-up will occur on the passenger side, which is facilitated by the one-way circulation in front of the school.
- The internal site roadway will be wide enough to accommodate a stacked vehicle lane and a travel lane in front of the school and will provide two-way circulation for the rest of the campus, thus facilitating easy and safe circulation throughout the site.
- The installation of school speed zone signs to promote slower speeds along 14th Street will be coordinated with the District of Columbia Department of Public Works to serve The Kingsbury Center, the West Elementary School, and the surrounding community, especially on 14th Street.

Parking Considerations

- The off-street parking requirement at capacity based on zoning consists of 107 parking spaces, which can be served by the proposed parking supply of 124 parking spaces. Seventeen spaces of the proposed parking supply would be available for visitors and parents. Although sufficient parking is provided on site, there is unrestricted curbside parking on the west side of 14th Street in front of The Kingsbury Center that can be used for special occasions.

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